Image AF 1711

PTO/SB/21 (08-03)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	10/047,527
Filing Date	10/23/2001
First Named Inventor	Anthony M. Chasser
Art Unit	1711
Examiner Name	Melanie Bissett
Attorney Docket Number	1700A1

Total Number of Pages in This Submission: 59

ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
- [x] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance communication to Technology Center (TC)
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) (please Identify below):

Remarks

Appeal Brief filed in triplicate

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Krisanne Shideler, Reg. No. 36,272 BLK Law Group
Signature	
Date	01/28/2004

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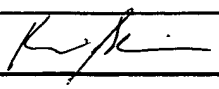
Signature		Date	01/28/2004

PTO/SB/17 (10-03)
Approved for use through 07/31/2006. OMB 0651-0032
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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 330.

Complete if Known	
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METHOD OF PAYMENT *(check all that apply)*

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☑ Deposit Account:

Deposit Account Number: 502800

Deposit Account Name: BLK Law Group

The Director is authorized to: *(check all that apply)*

☑ Charge fee(s) indicated below ☐ Credit any overpayments

☐ Charge any additional fee(s) or any underpayment of fee(s)

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

	Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =		X	=
Independent Claims		- 3** =		X	=
Multiple Dependent					=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	330
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 330.

SUBMITTED BY

(Complete *(if applicable)*)

Name *(Print/Type)*	Krisanne Shideler	Registration No. *(Attorney/Agent)*	36,272	Telephone	724-934-5450
Signature				Date	01/28/2004

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	: Confirmation No. 3962
Anthony M. Chasser et al.	: PATENT APPLICATION
Serial No. 10/047,527	: Group Art Unit: 1711
Filed: October 23, 2001	: Examiner: Melanie Bissett
For: THE USE OF ANTI-OXIDANTS IN CLEAR POWDER COATINGS TO REDUCE FILIFORM CORROSION OVER ALUMINUM	: Atty. Docket No. 1700A1

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in support of the Notice of Appeal mailed November 26, 2003, and received in the U. S. Patent and Trademark Office on November 28, 2003, appealing the final rejection of claims 5-7, 9, 13-15, and 18. The Commissioner is hereby authorized to charge deposit account 502800 for any and all fees necessary for filing this brief. The following headings correspond to the requirements of 37 CFR §1.192(c).

02/03/2004 WABDELR1 00000134 502800 10047527
01 FC:1401 330.00 DA

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on January 28, 2004
(Date of Deposit and Signatur)
Krisanne Shid ler
(Signature)

(1) REAL PARTY IN INTEREST

The present application is assigned to PPG Industries Ohio, Inc. and the real party in interest is PPG Industries Ohio, Inc. having offices at 3800 West 143 Street, Cleveland, Ohio 44111, a wholly-owned subsidiary of PPG Industries, Inc. having offices at One PPG Place, Pittsburgh, Pennsylvania 15272.

(2) RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to appellants, the appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board of Appeals ("Board")'s decision in the pending appeal.

(3) STATUS OF CLAIMS

Claims 5-7, 9, 13-15, and 18 are all the claims pending in the application, and all were rejected. Claims 1-4, 8, 10-12, 16, and 17 have been cancelled. Claims 3 (now cancelled), 5, 6, 9, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Geary et al., U. S. Patent No. 4,801,680 (hereinafter referred to as "Geary") as evidenced by Laver, U. S. Patent No. 6,103,794 (hereinafter referred to as "Laver"). Claims 3, 5, 6, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Chasser et al., U. S. Patent No. 6,069,221 (hereinafter referred to as "Chasser") as evidenced by Laver. Claim 4 (now cancelled), the subject matter of which has been incorporated into claim 18, was rejected under 35 U.S.C. §103(a) as being unpatentable over Chasser as evidenced by Laver, and in view of Nakae et al., U. S. Patent No. 5,719,212 (hereinafter referred to as "Nakae"). Claim 4, (again, the subject matter of which has been incorporated into claim 18), was additionally rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver and in view of Nakae. Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver. Claims 5-7, 9, 13-15, and 18 are on appeal.

As discussed below, the amendment to claim 18 adding the language of cancelled claim 4 is believed to alter the basis of rejection of the remaining

claims. It is believed that the Examiner is now rejecting claims 5-7, 9, 13-15, and 18 under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver taken in view of Nakae. In a similar fashion, it is believed that the Examiner is now rejecting claims 5, 6, 13-15, and 18 under 35 U.S.C. §103(a) as being unpatentable over Chasser as evidenced by Laver taken in view of Nakae.

(4) STATUS OF AMENDMENTS

A Final Rejection in the above application was mailed August 26, 2003; claims 3-7, 9, 13-15, and 18, which includes all the claims currently pending in the application, were rejected. Claim 4 was rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, claim 4 depended from a non-existent claim 19. Claim 4 was subsequently cancelled, the subject matter of which having been incorporated into independent claim 18, rendering the rejection under 35 USC §112, second paragraph, moot. Claims 3, 5, 6, 9, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Geary as evidenced by Laver. Claims 3, 5, 6, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Chasser as evidenced by Laver. Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Chasser as evidenced by Laver, and in view of Nakae. As noted above it is assumed that this rejection will essentially be applied by the Examiner against claims 5, 6, 13-15, and 18. Claim 4 was additionally rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver and in view of Nakae. As noted above it is assumed that this rejection will essentially be applied by the Examiner against claims 5-7, 9 13-15, and 18. Claim 7 was also rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver, and this rejection was listed separately in the Office Action.

An Amendment After Final Action (hereinafter "Amendment") was timely filed. The Amendment cancelled claims 3 and 4 and substantively amended claim 18 by incorporating the subject matter of claim 4, to place the claims in

better condition for appeal. The Amendment was entered as evidenced in the Advisory Office Action dated December 9, 2003. The Examiner noted that the rejections were maintained, and it has been assumed by Appellants that they are applied as discussed above.

(5) SUMMARY OF THE INVENTION

The present invention provides a coated aluminum substrate containing a cured coating, which in turn is derived from a coating composition comprising: (a) a polymer containing carboxylic functional groups, (b) a beta-hydroxyalkylamide curing agent having functional groups reactive with the functional groups of the polymer which is present in an amount sufficient to cure the polymer, and (c) 0.5 to 10 weight percent (based on the total weight of resin solids in the coating composition) of 2,6-di-tert-butyl-4-methyl-phenol (page 2, lines 9-13; page 6, lines 26-31; page 8, line 9; claim 18). The coated substrate is explicitly characterized as having improved filiform corrosion resistance compared to a similar coated substrate that does not contain 2,6-di-tert-butyl-4-methyl-phenol in the cured coating (page 11, Table 2, Example 1; claim 18). In one embodiment of the present invention, the polymer of (a) containing carboxylic functional groups may be selected from acrylic polymers, polyester polymers, and polyurethane polymers (page 2, lines 10-12; claim 5); in a particular embodiment, it is an acrylic polymer (claim 15). In one embodiment of the present invention, the polymer has a number average molecular weight of from 1000 to 20,000 (claim 6). The polymer additionally may have an equivalent weight of from 200 to 2500 (page 3, line 15; page 5, line 7; page 6, line 12; claim 7). The polymer of (a) may typically be present in the powder coating composition in an amount ranging from 10 to 80 percent by weight based on the total weight of resin solids in the powder coating composition (claim 13). In one embodiment of the invention, the beta-hydroxyalkylamide curing agent of (b) is bis-hydroxyethylamide (claim 9). The curing agent may be present in the powder coating composition in an amount ranging from 2 to 40 percent by weight based on the total weight of resin solids in the powder coating composition (page 7, lines 29-30; claim 14).

The coated aluminum substrates of the present invention, which contain a cured coating composition derived from a coating composition containing 2,6-di-tert-butyl-4-methyl-phenol, demonstrate improved filiform corrosion resistance compared to coated aluminum substrates that are coated with compositions containing other phenolic anti-oxidants such as 3,5-di-tertiary-butyl-4-hydroxyphenol compounds. Filiform corrosion appears as a filamentous, worm-like defect under a coating layer, adversely affecting appearance, and worse, often leads to coating delamination (peeling), making it a serious problem. It is particularly common over aluminum. Table 2 on page 11 in the specification shows a comparison of a coated aluminum substrate of the present invention compared to substrates coated with coating compositions containing hydroxyl-adjacent di-substituted phenolic anti-oxidants (such as Irganox® 1076, a 3,5-di-tertiary-butyl-4-hydroxyphenol compound, also disclosed in Chasser and Geary). Note that the coated aluminum substrate prepared in accordance with the present invention; i. e., coated with compositions containing 2,6-di-tert-butyl-4-methyl-phenol, (Example 1, row 1 of Table 2) demonstrates markedly improved filiform corrosion resistance as evidenced by lower filament density compared to substrates coated with compositions containing other hydroxyl-adjacent di-substituted phenolic anti-oxidants (see Examples 1, 4, 5, and 6, where the substrates coated with compositions containing hydroxyl-adjacent di-substituted phenolic anti-oxidants are compared directly to the coated substrate of the present invention). The presence of 2,6-di-tert-butyl-4-methyl-phenol in the coating compositions used to prepare the coated aluminum substrates of the present invention is critical to the filiform corrosion resistance performance of the invention. The examples further demonstrate the use of 2,6-di-tert-butyl-4-methyl-phenol within the claimed ranges of 0.5 to 10 percent by weight based on the total weight of resin solids in the powder coating composition.

(6) ISSUES

(i) No issues relating to 35 U.S.C. §112, first paragraph.

(ii) No issues relating to 35 U.S.C. §112, second paragraph. The rejection of claim 4 under 35 U.S.C. §112, second paragraph, is now moot with the cancellation of claim 4.

(iii) No issues relating to 35 U.S.C. §102. The rejections under 35 U.S.C. §102 are believed to be moot with the incorporation of the subject matter of now cancelled claim 4 into independent claim 18.

(iv) There are two issues relating to 35 U.S.C. §103(a).

(a) Whether the subject matter of 5-7, 9, 13-15, and 18 are obvious in view of the teachings of Geary as evidenced by Laver taken in view of the teachings of Nakae.

(b) Whether the subject matter of 5, 6, 13-15, and 18 are obvious in view of the teachings of Chasser as evidenced by Laver taken in view of the teachings of Nakae.

(7) GROUPING OF CLAIMS

Claims 5, 6, 13, 14 and 18 stand or fall together. Claims 7 and 9 stand or fall together. Claims 7 and 9 do not have Chasser applied against them (Issue (iv) (b)) and therefore stand separately from 5, 6, 13, 14 and 18. Claim 15 stands or falls alone. Claim 15 includes limitations that further distinguish this claim from the teachings of Geary, which supports the standing of claim 15.

(8) ARGUMENTS

(i) No issue.

(ii) No issue.

(iii) No issue.

(iv) (a) Whether the subject matter of 5-7, 9, 13-15, and 18 are obvious in view of the teachings of Geary as evidenced by Laver taken in view of the teachings of Nakae.

Claims 5, 6, 13, 14 and 18:

Claims 5, 6, 13, 14, and 18 are assumed to be rejected under 35 U.S.C. §103(a) as being obvious over Geary as evidenced by Laver and in view of Nakae. In both the Office Action of April 3, 2003, and the Final Office Action of August 26, 2003, the Examiner asserts that "Geary discloses thermosetting powder coating compositions comprising carboxylic acid-containing polyesters and beta-hydroxyalkylamide curing agents" (Geary, col. 1, lines 34-39). The Examiner further asserts that "examples show bis-hydroxyethylamide compounds and carboxylic acid group-containing polyester polymers having a number average molecular weight of 3500-4500. Example 1A suggests the combination of 72.4 percent by weight carboxylic acid-containing polyester, 4.3 percent by weight bis-hydroxyethylamide, and 1.5 percent by weight Irganox® 1076." Laver provides the structure of Irganox® 1076, which is n-octadecyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate, a phenolic compound having branched butyl groups in positions ortho to the hydroxy group. The coatings are applied to metal substrates, including aluminum. As noted by the Examiner in the Office Action of April 3, 2003, neither Geary nor Laver mentions the use of 2,6-di-tert-butyl-4-methyl-phenol. The Nakae reference teaches acid-epoxy type powder coating compositions comprising antioxidants having a melting point of from 50°C to 140°C. The Examiner relies on Nakae for teaching the use of 2,6-di-tert-butyl-4-methyl-phenol in powder coating compositions, asserting that certain phenol antioxidants, including 2,6-di-tert-butyl-4-methyl-phenol, are preferred in powder compositions because of their melting points. The Examiner concludes that it would have been obvious to one skilled in the art to choose 2,6-di-tert-butyl-4-methyl-phenol as a phenolic antioxidant in Geary's composition to form coatings having improved blocking resistance and melt processability.

Appellants respectfully submit that the basis on which the claims were rejected is not a valid rejection under 35 U. S. C. §103(a). First, if the references are considered each in their entirety, there is no motivation to combine the teachings of Geary with those of Nakae. Secondly, even if one were to combine the whole teaching of Geary with the whole teaching of Nakae, one would not arrive at the present invention as claimed.

References Considered as a Whole Offer No Motivation to Combine

The motivation to modify the prior art must flow from some teaching in the art that suggests the desirability or incentive to make the modification needed to arrive at the claimed invention. See *In re Napier*, 55 F.3d 610, 613, 34 U.S.P.Q.2d 1782, 1784 (Fed. Cir. 1995). Geary discloses thermosetting powder coating compositions that comprise a co-reactable particulate mixture of carboxylic acid group-containing polyesters and beta-hydroxyalkylamide curing agents (Abstract). Examples 1A, 2A, 3 and 4 disclose the use of Irganox® 1076 as an additive in these powder coating compositions. The additive is defined in footnote 3 of Example 1 as a polyphenol stabilizer that inhibits oxidation. Anti-oxidants are not taught, suggested, or recommended anywhere else in the reference. All of the examples in Geary demonstrate coatings applied over steel panels. Nakae discloses a different powder coating composition relying on a different cure chemistry, comprising an epoxy group-containing acrylic resin; a polycarboxylic acid; and an anti-oxidant having a melting point of from 50° to 140°C (Abstract). A list of over *fifty* anti-oxidants is provided (Nakae col. 3. Line 35-col. 4, line 49), which includes 2,6-di-tert-butyl-4-methyl-phenol and n-octadecyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate (Irganox® 1076). There is no teaching or suggestion in Nakae that the anti-oxidants used therein are suitable for use in any other coatings; moreover, coatings comprising carboxylic acid group-containing resins and beta-hydroxyalkylamide curing agents are not disclosed at all. The only coating composition disclosed in Nakae undergoes an acid-epoxy type cure mechanism. There is no teaching or suggestion that any of the anti-oxidants in Nakae would be effective in a carboxylic acid/beta-hydroxyalkylamide system

such as that disclosed in Geary, much less that 2,6-di-tert-butyl-4-methyl-phenol would be equally effective as Irganox® 1076 in the system disclosed by Geary, such that one skilled in the art would be led to substitute the one anti-oxidant for the other.

The Examiner in both Office Actions alleges that the motivation to modify the composition of Geary with the 2,6-di-tert-butyl-4-methyl-phenol of Nakae is in order to form coatings having improved blocking resistance and melt processability. However, this proposed motivation to modify the Geary reference with the teaching of Nakae to use 2,6-di-tert-butyl-4-methyl-phenol is not supported. There is *no* teaching or suggestion in Nakae that 2,6-di-tert-butyl-4-methyl-phenol may be better than Irganox® 1076 for blocking resistance and melt processability in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents, such as that disclosed in Geary, or even that 2,6-di-tert-butyl-4-methyl-phenol is better than Irganox® 1076 for blocking resistance and melt processability in *any* powder coating composition.

There is absolutely no motivation to modify the compositions of Geary by particularly choosing the 2,6-di-tert-butyl-4-methyl-phenol of Nakae for improving blocking resistance and/or melt processability as suggested by the Examiner, or for any other reason, because none is offered by either reference, taken alone or in combination. Additionally, there is no teaching or suggestion in either reference, taken alone or in combination, to use the 2,6-di-tert-butyl-4-methyl-phenol of Nakae in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents, much less over an aluminum substrate, since neither reference demonstrates the use of such a combination over aluminum.

References Considered as a Whole Teach Away from Invention

If one were to combine the whole teachings of Geary with the whole teaching of Nakae, one would not arrive at the present invention as claimed; i. e., a coated aluminum substrate containing a cured coating derived from a coating composition comprising:

(a) a polymer containing carboxylic functional groups;

(b) a beta hydroxyalkylamide curing agent having functional groups reactive with the functional groups of the polymer which is present in an amount sufficient to cure the polymer; and

(c) 0.5 to 10 weight percent based on the total weight of resin solids in the coating composition of 2,6-di-tert-butyl-4-methyl-phenol, the coated substrate being characterized as having improved filiform corrosion resistance compared to a similar coated substrate that does not contain (c) in the cured coating.

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 353 F.2d 238, 241, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). See also MPEP §2141.02: "[a] prior art reference must be considered in its entirety, i. e., as a whole, including portions that would lead away from the claimed invention." If the references are considered each in their entirety, the teachings of Nakae combined with Geary teach away from the present invention. As mentioned earlier, Geary discloses thermosetting powder coating compositions that comprise a co-reactable particulate mixture of carboxylic acid group-containing polyesters and beta-hydroxyalkylamide curing agents. Nakae discloses a powder coating composition comprising an epoxy group-containing acrylic resin; a polycarboxylic acid; and any of over fifty anti-oxidants having a melting point of from 50° to 140°C. While a variety of metal substrates including both steel and aluminum are disclosed in Nakae (col. 6, lines 26-30), the only substrate on which the coating composition is demonstrated is steel. Likewise, all of the examples in Geary demonstrate coatings applied over steel panels. If one were to combine both references after considering them in their entirety, in order to prepare a coated substrate containing a cured coating, which in turn is derived from a coating composition comprising a polymer containing carboxylic functional groups, a beta-hydroxyalkylamide curing agent, and an anti-oxidant, one skilled in the art would use a steel substrate, since both references clearly demonstrate the use of their respective coating

compositions over steel. Additionally, one is not likely to choose 2,6-di-tert-butyl-4-methyl-phenol from among a list of over fifty other anti-oxidants, without any guidance to do so offered by the Nakae reference. Further, since neither reference recognizes the improvement in filiform corrosion resistance over aluminum afforded by the use of 2,6-di-tert-butyl-4-methyl-phenol, there would be no particular impetus to use an aluminum substrate or 2,6-di-tert-butyl-4-methyl-phenol, and therefore it would not have been obvious to do so.

Claim 15

The discussion under the heading "Claims 5, 6, 13, 14, and 18" is incorporated herein by reference.

Claim 15 recites the coated aluminum substrate of claim 18 where said polymer is an acrylic polymer. The Examiner asserts in both Office Actions that Example 2A in Geary "shows the combination of carboxylic acid-containing polyester, carboxylic acid-containing acrylic polymer, a bis-hydroxyethylamide, and Irganox® 1076". As noted above, Geary discloses thermosetting powder coating compositions that comprise a co-reactable particulate mixture of carboxylic acid group-containing *polyesters* and beta-hydroxyalkylamide curing agents. The acrylic polymer disclosed in Example 2 is used in very minor amounts (less than 5 percent by weight of the resinous binder; less than 3.5 percent by weight of total resin solids). One skilled in the art would hardly look to Geary for a teaching of coating compositions containing carboxylic acid functional acrylics because Geary teaches a powder coating composition containing polyester polymers. Claim 15 is therefore believed to further distinguish the coated aluminum substrate of the present invention from Geary taken alone or in combination with Nakae.

Claims 7 and 9

The discussion under the heading "Claims 5, 6, 13, 14, and 18" is incorporated herein by reference.

Claim 7 recites the coated aluminum substrate of claim 18 wherein said polymer has an equivalent weight of from 200 to 2500. Claim 9 recites the

coated aluminum substrate of claim 18 wherein the beta-hydroxyalkylamide is bis-hydroxyethylamide. The arguments presented above with respect to claims 5, 6, 13, 14, and 18 apply here, and it is noted as above in the Grouping of Claims that claims 7 and 9 stand or fall together, independently of 5, 6, 13, 14 and 18. Claims 7 and 9 do not have Chasser applied against them (Issue (iv)(b)) and therefore stand separately from 5, 6, 13, 14 and 18.

(iv)(b) Whether the subject matter of 5, 6, 13-15, and 18 are obvious in view of the teachings of Chasser as evidenced by Laver taken in view of the teachings of Nakae.

Claims 5, 6, 13, 14 and 18:

Claims 5, 6, 13, 14, and 18 are assumed to be rejected under 35 U.S.C. §103(a) as being obvious over Chasser as evidenced by Laver and in view of Nakae. In both the Office Action of April 3, 2003, and the Final Office Action of August 26, 2003, the Examiner asserts that "Chasser discloses curable powder coating compositions comprising polymers with functional groups and curing agents reactive with the polymers that are applied to aluminum substrates (Abstract)." The Examiner further asserts that the polymers are selected from carboxylic acid group-containing polyester polymers having a number average molecular weight of 2000-3000, carboxylic acid group-containing acrylic polymers, carboxylic acid group-containing polyurethane polymers, and epoxy functional polymers. Polymers are used in preferred amounts of 50-85 percent by weight. Curing agents include beta-hydroxyalkylamides and triglycidylisocyanurate (TGIC). Irganox® anti-oxidants are noted as suitable additives. Example A shows the combination of a carboxylic acid-containing polyester, 12.9 percent by weight TGIC, and about 1 percent by weight Irganox® 1076. Laver provides the structure of Irganox® 1076. Example C shows the combination of a carboxylic acid-containing polyester, a beta-hydroxyalkylamide curing agent, and Tinuvin® 900, a phenolic ultraviolet light stabilizer having substituents at ortho positions to the hydroxy group. As noted by the Examiner in the Office Action of April 3, 2003, neither Chasser nor Laver

mentions the use of 2,6-di-tert-butyl-4-methyl-phenol. The Nakae reference teaches acid-epoxy type powder coating compositions comprising antioxidants having a melting point of from 50°C to 140°C. The Examiner relies on Nakae for teaching the use of 2,6-di-tert-butyl-4-methyl-phenol in powder coating compositions, asserting that certain phenol antioxidants, including 2,6-di-tert-butyl-4-methyl-phenol, are preferred in powder compositions because of their melting points. The Examiner concludes that it would have been obvious to one skilled in the art to choose 2,6-di-tert-butyl-4-methyl-phenol as a phenolic antioxidant in Chasser's composition to form coatings having improved blocking resistance and melt processability.

Appellants respectfully submit that the basis on which the claims were rejected is not a valid rejection under 35 U. S. C. §103(a). First, if the references are considered each in their entirety, there is no motivation to combine the teachings of Chasser with those of Nakae. Secondly, even if one were to combine the whole teaching of Chasser with the whole teaching of Nakae, one would not arrive at the present invention as claimed.

References Considered as a Whole Offer No Motivation to Combine

The Examiner in both Office Actions alleges that the motivation to modify the composition of Chasser with the 2,6-di-tert-butyl-4-methyl-phenol of Nakae is in order to form coatings having improved blocking resistance and melt processability. However, this proposed motivation to modify the Chasser reference with the teaching of Nakae to use 2,6-di-tert-butyl-4-methyl-phenol is not supported. As noted above, there is *no* teaching or suggestion in Nakae that 2,6-di-tert-butyl-4-methyl-phenol is better than Irganox® 1076 for blocking resistance and melt processability in *any* powder coating composition, let alone that 2,6-di-tert-butyl-4-methyl-phenol may be better than Irganox® 1076 for blocking resistance and melt processability in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents, which is only one of a collection of coating systems disclosed by Chasser that includes carboxylic acid functional polymers/polyepoxide curing

agents, carboxylic acid functional polymers/TGIC, and epoxy functional polymers/polyacid curing agents.

One skilled in the art would not be motivated to improve blocking resistance and/or melt processability of the Chasser composition by particularly choosing the 2,6-di-tert-butyl-4-methyl-phenol of Nakae because no teaching or suggestion is made in either reference, taken alone or in combination, of improved blocking resistance and/or melt processability offered by 2,6-di-tert-butyl-4-methyl-phenol. Additionally, there is no teaching or suggestion in either reference, taken alone or in combination, to select the 2,6-di-tert-butyl-4-methyl-phenol of Nakae for any reason and use it in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents.

References Considered as a Whole Teach Away from Invention

If one were to combine the whole teachings of Chasser with the whole teaching of Nakae, one would not arrive at the present invention as claimed. Chasser discloses curable powder coating compositions comprising polymers with functional groups and curing agents reactive with the polymers. The composition further comprises an oligomeric acid functional polyester with a particular structure as shown in col. 2, lines 40-48, which is the defining feature of the Chasser composition. The oligomeric polyester provides the composition with improved adhesion to metal and filiform corrosion resistance. The polymers with functional groups used by Chasser may be any of a variety of polymers with any of a variety of functional groups. Likewise, the curing agents may be selected from any of a number of different materials, depending on the functionality of the polymer. As mentioned above, carboxylic acid functional polymers/polyepoxide curing agents, carboxylic acid functional polymers/TGIC, and epoxy functional polymers/polyacid curing agents are all disclosed by Chasser as suitable coating systems. Nakae discloses exclusively an epoxy group-containing acrylic resin; a polycarboxylic acid; and an anti-oxidant having a melting point of from 50° to 140°C (Abstract). As noted above, list of over *fifty* anti-oxidants is provided, which includes 2,6-di-

tert-butyl-4-methyl-phenol and Irganox® 1076. There is no teaching or suggestion in Nakae that the anti-oxidants used therein are suitable for use in any other coatings; moreover, coatings comprising carboxylic acid group-containing resins and beta-hydroxyalkylamide curing agents are not disclosed at all in Nakae. The only coating composition disclosed in Nakae undergoes an acid-epoxy type cure mechanism. There is no teaching or suggestion that any of the other anti-oxidants in Nakae would be effective in a carboxylic acid/beta-hydroxyalkylamide system, much less that 2,6-di-tert-butyl-4-methyl-phenol would be equally effective as Irganox® 1076 a carboxylic acid/beta-hydroxyalkylamide system, such that one skilled in the art would be led to use the particular anti-oxidant 2,6-di-tert-butyl-4-methyl-phenol in the particular coating composition comprising carboxylic acid group-containing resins and beta-hydroxyalkylamide curing agents.

If the references are considered each in their entirety, the teachings of Nakae combined with Chasser teach away from the present invention. As mentioned earlier, Chasser discloses curable powder coating compositions comprising polymers with any of a number of functional groups and curing agents reactive with the polymers. Nakae discloses a powder coating composition comprising an epoxy group-containing acrylic resin; a polycarboxylic acid; and any of over fifty anti-oxidants having a melting point of from 50° to 140°C. If one were to combine both references after considering them in their entirety, in order to prepare a coated substrate containing a cured coating, which in turn is derived from a coating composition comprising a polymer containing functional groups, a curing agent, and an anti-oxidant, one skilled in the art would use an epoxy group-containing resin and a polycarboxylic acid curing agent, since that is the coating composition common to both references. Additionally, one is not likely to choose 2,6-di-tert-butyl-4-methyl-phenol from among a list of over fifty other anti-oxidants, without any guidance to do so offered by the Nakae reference. Further, since neither reference recognizes the improvement in filiform corrosion resistance over aluminum afforded by the use of 2,6-di-tert-butyl-4-methyl-phenol (Chasser has already achieved filiform corrosion resistance with the oligomeric polyester),

there would be no particular reason to use 2,6-di-tert-butyl-4-methyl-phenol, and therefore it would not have been obvious to do so.

Claim 15

The discussion under the heading "Claims 5, 6, 13, 14, and 18" is incorporated herein by reference.

Claim 15 recites the coated aluminum substrate of claim 18 where said polymer is an acrylic polymer. The arguments presented above with respect to claims 5, 6, 13, 14, and 18 apply here, and it is noted as above in the Grouping of Claims that claim 15 includes limitations that further distinguish this claim from the teachings of Geary (Issue (iv)(a)), which supports the standing of claim 15.

CONCLUSION

Appellants have shown that if the references are considered each in their entirety, there is no motivation to combine the teachings of the Geary reference with Nakae in order to arrive at the present invention. Likewise, there is no motivation to combine the teachings of the Chasser reference with Nakae in order to arrive at the present invention. Appellants have further shown that if one were to combine the whole teachings of Geary or Chasser with the whole teaching of the Nakae, one would not arrive at the present invention as claimed.

Based on the above, Appellants respectfully request that the Board reverse the Examiner on the rejections of claims 5, 6, 7, 9, 13, 14, 15 and 18 as unpatentable under 35 U.S.C. 103 over the applied prior art and allow these claims.

Respectfully submitted,

KRISANNE SHIDELER
Registration No. 36,272
Agent of Record

(724) 934-5450

Pittsburgh, Pennsylvania
January 28, 2004

App ndix

THE CLAIMS ON APPEAL

5. The coated aluminum substrate of claim 18 wherein said polymer containing carboxylic groups is selected from the group consisting of acrylic polymers, polyester polymers, and polyurethane polymers.

6. The coated aluminum substrate of claim 18 wherein said polymer has a number average molecular weight of from 1,000 to 20,000.

7. The coated aluminum substrate of claim 18 wherein said polymer has an equivalent weight equal from 200 to 2,500.

9. The coated aluminum substrate of claim 18 wherein the beta-hydroxyalkylamide is bis-hydroxyethylamide.

13. The coated aluminum substrate of claim 18 wherein said polymer is present in an amount ranging from 10 to 80 weight percent based on the total weight resin solids in the powder coating composition.

14. The coated aluminum substrate of claim 18 wherein said curing agent is present in an amount ranging from 2 to 40 weight percent based on the total weight resin solids in the powder coating composition.

15. The coated aluminum substrate of claim 18 where said polymer is an acrylic polymer.

18. A coated aluminum substrate containing a cured coating derived from a coating composition comprising:

a. a polymer containing carboxylic functional groups;

b. a beta hydroxyalkylamide curing agent having functional groups reactive with the functional groups of the polymer which is present in an amount sufficient to cure the polymer; and

c. 0.5 to 10 weight percent based on the total weight of resin solids in the coating composition of 2,6-di-tert-butyl-4-methyl-phenol, the coated substrate being characterized as having improved filiform corrosion resistance compared to a similar coated substrate that does not contain (c) in the cured coating.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	: Confirmation No. 3962
Anthony M. Chasser et al.	: PATENT APPLICATION
Serial No. 10/047,527	: Group Art Unit: 1711
Filed: October 23, 2001	: Examiner: Melanie Bissett
For: THE USE OF ANTI-OXIDANTS IN CLEAR POWDER COATINGS TO REDUCE FILIFORM CORROSION OVER ALUMINUM	: Atty. Docket No. 1700A1

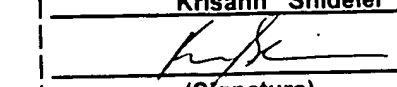
BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in support of the Notice of Appeal mailed November 26, 2003, and received in the U. S. Patent and Trademark Office on November 28, 2003, appealing the final rejection of claims 5-7, 9, 13-15, and 18. The Commissioner is hereby authorized to charge deposit account 502800 for any and all fees necessary for filing this brief. The following headings correspond to the requirements of 37 CFR §1.192(c).

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on January 28, 2004
(Date of Deposit and Signature)
Krisann Shideler



(Signature)

(1) REAL PARTY IN INTEREST

The present application is assigned to PPG Industries Ohio, Inc. and the real party in interest is PPG Industries Ohio, Inc. having offices at 3800 West 143 Street, Cleveland, Ohio 44111, a wholly-owned subsidiary of PPG Industries, Inc. having offices at One PPG Place, Pittsburgh, Pennsylvania 15272.

(2) RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to appellants, the appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board of Appeals ("Board")'s decision in the pending appeal.

(3) STATUS OF CLAIMS

Claims 5-7, 9, 13-15, and 18 are all the claims pending in the application, and all were rejected. Claims 1-4, 8, 10-12, 16, and 17 have been cancelled. Claims 3 (now cancelled), 5, 6, 9, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Geary et al., U. S. Patent No. 4,801,680 (hereinafter referred to as "Geary") as evidenced by Laver, U. S. Patent No. 6,103,794 (hereinafter referred to as "Laver"). Claims 3, 5, 6, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Chasser et al., U. S. Patent No. 6,069,221 (hereinafter referred to as "Chasser") as evidenced by Laver. Claim 4 (now cancelled), the subject matter of which has been incorporated into claim 18, was rejected under 35 U.S.C. §103(a) as being unpatentable over Chasser as evidenced by Laver, and in view of Nakae et al., U. S. Patent No. 5,719,212 (hereinafter referred to as "Nakae"). Claim 4, (again, the subject matter of which has been incorporated into claim 18), was additionally rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver and in view of Nakae. Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver. Claims 5-7, 9, 13-15, and 18 are on appeal.

As discussed below, the amendment to claim 18 adding the language of cancelled claim 4 is believed to alter the basis of rejection of the remaining

claims. It is believed that the Examiner is now rejecting claims 5-7, 9, 13-15, and 18 under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver taken in view of Nakae. In a similar fashion, it is believed that the Examiner is now rejecting claims 5, 6, 13-15, and 18 under 35 U.S.C. §103(a) as being unpatentable over Chasser as evidenced by Laver taken in view of Nakae.

(4) STATUS OF AMENDMENTS

A Final Rejection in the above application was mailed August 26, 2003; claims 3-7, 9, 13-15, and 18, which includes all the claims currently pending in the application, were rejected. Claim 4 was rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, claim 4 depended from a non-existent claim 19. Claim 4 was subsequently cancelled, the subject matter of which having been incorporated into independent claim 18, rendering the rejection under 35 USC §112, second paragraph, moot. Claims 3, 5, 6, 9, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Geary as evidenced by Laver. Claims 3, 5, 6, 13-15, and 18 were rejected under 35 U.S.C. §102(b) as being unpatentable over Chasser as evidenced by Laver. Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Chasser as evidenced by Laver, and in view of Nakae. As noted above it is assumed that this rejection will essentially be applied by the Examiner against claims 5, 6, 13-15, and 18. Claim 4 was additionally rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver and in view of Nakae. As noted above it is assumed that this rejection will essentially be applied by the Examiner against claims 5-7, 9 13-15, and 18. Claim 7 was also rejected under 35 U.S.C. §103(a) as being unpatentable over Geary as evidenced by Laver, and this rejection was listed separately in the Office Action.

An Amendment After Final Action (hereinafter "Amendment") was timely filed. The Amendment cancelled claims 3 and 4 and substantively amended claim 18 by incorporating the subject matter of claim 4, to place the claims in

better condition for appeal. The Amendment was entered as evidenced in the Advisory Office Action dated December 9, 2003. The Examiner noted that the rejections were maintained, and it has been assumed by Appellants that they are applied as discussed above.

(5) SUMMARY OF THE INVENTION

The present invention provides a coated aluminum substrate containing a cured coating, which in turn is derived from a coating composition comprising: (a) a polymer containing carboxylic functional groups, (b) a beta-hydroxyalkylamide curing agent having functional groups reactive with the functional groups of the polymer which is present in an amount sufficient to cure the polymer, and (c) 0.5 to 10 weight percent (based on the total weight of resin solids in the coating composition) of 2,6-di-tert-butyl-4-methyl-phenol (page 2, lines 9-13; page 6, lines 26-31; page 8, line 9; claim 18). The coated substrate is explicitly characterized as having improved filiform corrosion resistance compared to a similar coated substrate that does not contain 2,6-di-tert-butyl-4-methyl-phenol in the cured coating (page 11, Table 2, Example 1; claim 18). In one embodiment of the present invention, the polymer of (a) containing carboxylic functional groups may be selected from acrylic polymers, polyester polymers, and polyurethane polymers (page 2, lines 10-12; claim 5); in a particular embodiment, it is an acrylic polymer (claim 15). In one embodiment of the present invention, the polymer has a number average molecular weight of from 1000 to 20,000 (claim 6). The polymer additionally may have an equivalent weight of from 200 to 2500 (page 3, line 15; page 5, line 7; page 6, line 12; claim 7). The polymer of (a) may typically be present in the powder coating composition in an amount ranging from 10 to 80 percent by weight based on the total weight of resin solids in the powder coating composition (claim 13). In one embodiment of the invention, the beta-hydroxyalkylamide curing agent of (b) is bis-hydroxyethylamide (claim 9). The curing agent may be present in the powder coating composition in an amount ranging from 2 to 40 percent by weight based on the total weight of resin solids in the powder coating composition (page 7, lines 29-30; claim 14).

The coated aluminum substrates of the present invention, which contain a cured coating composition derived from a coating composition containing 2,6-di-tert-butyl-4-methyl-phenol, demonstrate improved filiform corrosion resistance compared to coated aluminum substrates that are coated with compositions containing other phenolic anti-oxidants such as 3,5-di-tertiary-butyl-4-hydroxyphenol compounds. Filiform corrosion appears as a filamentous, worm-like defect under a coating layer, adversely affecting appearance, and worse, often leads to coating delamination (peeling), making it a serious problem. It is particularly common over aluminum. Table 2 on page 11 in the specification shows a comparison of a coated aluminum substrate of the present invention compared to substrates coated with coating compositions containing hydroxyl-adjacent di-substituted phenolic anti-oxidants (such as Irganox® 1076, a 3,5-di-tertiary-butyl-4-hydroxyphenol compound, also disclosed in Chasser and Geary). Note that the coated aluminum substrate prepared in accordance with the present invention; i. e., coated with compositions containing 2,6-di-tert-butyl-4-methyl-phenol, (Example 1, row 1 of Table 2) demonstrates markedly improved filiform corrosion resistance as evidenced by lower filament density compared to substrates coated with compositions containing other hydroxyl-adjacent di-substituted phenolic anti-oxidants (see Examples 1, 4, 5, and 6, where the substrates coated with compositions containing hydroxyl-adjacent di-substituted phenolic anti-oxidants are compared directly to the coated substrate of the present invention). The presence of 2,6-di-tert-butyl-4-methyl-phenol in the coating compositions used to prepare the coated aluminum substrates of the present invention is critical to the filiform corrosion resistance performance of the invention. The examples further demonstrate the use of 2,6-di-tert-butyl-4-methyl-phenol within the claimed ranges of 0.5 to 10 percent by weight based on the total weight of resin solids in the powder coating composition.

(6) ISSUES

(i) No issues relating to 35 U.S.C. §112, first paragraph.

(ii) No issues relating to 35 U.S.C. §112, second paragraph. The rejection of claim 4 under 35 U.S.C. §112, second paragraph, is now moot with the cancellation of claim 4.

(iii) No issues relating to 35 U.S.C. §102. The rejections under 35 U.S.C. §102 are believed to be moot with the incorporation of the subject matter of now cancelled claim 4 into independent claim 18.

(iv) There are two issues relating to 35 U.S.C. §103(a).

(a) Whether the subject matter of 5-7, 9, 13-15, and 18 are obvious in view of the teachings of Geary as evidenced by Laver taken in view of the teachings of Nakae.

(b) Whether the subject matter of 5, 6, 13-15, and 18 are obvious in view of the teachings of Chasser as evidenced by Laver taken in view of the teachings of Nakae.

(7) GROUPING OF CLAIMS

Claims 5, 6, 13, 14 and 18 stand or fall together. Claims 7 and 9 stand or fall together. Claims 7 and 9 do not have Chasser applied against them (Issue (iv) (b)) and therefore stand separately from 5, 6, 13, 14 and 18. Claim 15 stands or falls alone. Claim 15 includes limitations that further distinguish this claim from the teachings of Geary, which supports the standing of claim 15.

(8) ARGUMENTS

(i) No issue.

(ii) No issue.

(iii) No issue.

(iv) (a) Whether the subj ct matter of 5-7, 9, 13-15, and 18 are obvious in view of the teachings of Geary as evidenced by Laver taken in view of the teachings of Nakae.

Claims 5, 6, 13, 14 and 18:

Claims 5, 6, 13, 14, and 18 are assumed to be rejected under 35 U.S.C. §103(a) as being obvious over Geary as evidenced by Laver and in view of Nakae. In both the Office Action of April 3, 2003, and the Final Office Action of August 26, 2003, the Examiner asserts that "Geary discloses thermosetting powder coating compositions comprising carboxylic acid-containing polyesters and beta-hydroxyalkylamide curing agents" (Geary, col. 1, lines 34-39). The Examiner further asserts that "examples show bis-hydroxyethylamide compounds and carboxylic acid group-containing polyester polymers having a number average molecular weight of 3500-4500. Example 1A suggests the combination of 72.4 percent by weight carboxylic acid-containing polyester, 4.3 percent by weight bis-hydroxyethylamide, and 1.5 percent by weight Irganox® 1076." Laver provides the structure of Irganox® 1076, which is n-octadecyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate, a phenolic compound having branched butyl groups in positions ortho to the hydroxy group. The coatings are applied to metal substrates, including aluminum. As noted by the Examiner in the Office Action of April 3, 2003, neither Geary nor Laver mentions the use of 2,6-di-tert-butyl-4-methyl-phenol. The Nakae reference teaches acid-epoxy type powder coating compositions comprising antioxidants having a melting point of from 50°C to 140°C. The Examiner relies on Nakae for teaching the use of 2,6-di-tert-butyl-4-methyl-phenol in powder coating compositions, asserting that certain phenol antioxidants, including 2,6-di-tert-butyl-4-methyl-phenol, are preferred in powder compositions because of their melting points. The Examiner concludes that it would have been obvious to one skilled in the art to choose 2,6-di-tert-butyl-4-methyl-phenol as a phenolic antioxidant in Geary's composition to form coatings having improved blocking resistance and melt processability.

Appellants respectfully submit that the basis on which the claims were rejected is not a valid rejection under 35 U. S. C. §103(a). First, if the references are considered each in their entirety, there is no motivation to combine the teachings of Geary with those of Nakae. Secondly, even if one were to combine the whole teaching of Geary with the whole teaching of Nakae, one would not arrive at the present invention as claimed.

References Considered as a Whole Offer No Motivation to Combine

The motivation to modify the prior art must flow from some teaching in the art that suggests the desirability or incentive to make the modification needed to arrive at the claimed invention. See *In re Napier*, 55 F.3d 610, 613, 34 U.S.P.Q.2d 1782, 1784 (Fed. Cir. 1995). Geary discloses thermosetting powder coating compositions that comprise a co-reactable particulate mixture of carboxylic acid group-containing polyesters and beta-hydroxyalkylamide curing agents (Abstract). Examples 1A, 2A, 3 and 4 disclose the use of Irganox® 1076 as an additive in these powder coating compositions. The additive is defined in footnote 3 of Example 1 as a polyphenol stabilizer that inhibits oxidation. Anti-oxidants are not taught, suggested, or recommended anywhere else in the reference. All of the examples in Geary demonstrate coatings applied over steel panels. Nakae discloses a different powder coating composition relying on a different cure chemistry, comprising an epoxy group-containing acrylic resin; a polycarboxylic acid; and an anti-oxidant having a melting point of from 50° to 140°C (Abstract). A list of over *fifty* anti-oxidants is provided (Nakae col. 3. Line 35-col. 4, line 49), which includes 2,6-di-tert-butyl-4-methyl-phenol and n-octadecyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate (Irganox® 1076). There is no teaching or suggestion in Nakae that the anti-oxidants used therein are suitable for use in any other coatings; moreover, coatings comprising carboxylic acid group-containing resins and beta-hydroxyalkylamide curing agents are not disclosed at all. The only coating composition disclosed in Nakae undergoes an acid-epoxy type cure mechanism. There is no teaching or suggestion that any of the anti-oxidants in Nakae would be effective in a carboxylic acid/beta-hydroxyalkylamide system

such as that disclosed in Geary, much less that 2,6-di-tert-butyl-4-methyl-phenol would be equally effective as Irganox® 1076 in the system disclosed by Geary, such that one skilled in the art would be led to substitute the one anti-oxidant for the other.

The Examiner in both Office Actions alleges that the motivation to modify the composition of Geary with the 2,6-di-tert-butyl-4-methyl-phenol of Nakae is in order to form coatings having improved blocking resistance and melt processability. However, this proposed motivation to modify the Geary reference with the teaching of Nakae to use 2,6-di-tert-butyl-4-methyl-phenol is not supported. There is *no* teaching or suggestion in Nakae that 2,6-di-tert-butyl-4-methyl-phenol may be better than Irganox® 1076 for blocking resistance and melt processability in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents, such as that disclosed in Geary, or even that 2,6-di-tert-butyl-4-methyl-phenol is better than Irganox® 1076 for blocking resistance and melt processability in *any* powder coating composition.

There is absolutely no motivation to modify the compositions of Geary by particularly choosing the 2,6-di-tert-butyl-4-methyl-phenol of Nakae for improving blocking resistance and/or melt processability as suggested by the Examiner, or for any other reason, because none is offered by either reference, taken alone or in combination. Additionally, there is no teaching or suggestion in either reference, taken alone or in combination, to use the 2,6-di-tert-butyl-4-methyl-phenol of Nakae in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents, much less over an aluminum substrate, since neither reference demonstrates the use of such a combination over aluminum.

References Considered as a Whole Teach Away from Invention

If one were to combine the whole teachings of Geary with the whole teaching of Nakae, one would not arrive at the present invention as claimed; i. e., a coated aluminum substrate containing a cured coating derived from a coating composition comprising:

(a) a polymer containing carboxylic functional groups;

(b) a beta hydroxyalkylamide curing agent having functional groups reactive with the functional groups of the polymer which is present in an amount sufficient to cure the polymer; and

(c) 0.5 to 10 weight percent based on the total weight of resin solids in the coating composition of 2,6-di-tert-butyl-4-methyl-phenol, the coated substrate being characterized as having improved filiform corrosion resistance compared to a similar coated substrate that does not contain (c) in the cured coating.

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 353 F.2d 238, 241, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). See also MPEP §2141.02: "[a] prior art reference must be considered in its entirety, i. e., as a whole, including portions that would lead away from the claimed invention." If the references are considered each in their entirety, the teachings of Nakae combined with Geary teach away from the present invention. As mentioned earlier, Geary discloses thermosetting powder coating compositions that comprise a co-reactable particulate mixture of carboxylic acid group-containing polyesters and beta-hydroxyalkylamide curing agents. Nakae discloses a powder coating composition comprising an epoxy group-containing acrylic resin; a polycarboxylic acid; and any of over fifty anti-oxidants having a melting point of from 50° to 140°C. While a variety of metal substrates including both steel and aluminum are disclosed in Nakae (col. 6, lines 26-30), the only substrate on which the coating composition is demonstrated is steel. Likewise, all of the examples in Geary demonstrate coatings applied over steel panels. If one were to combine both references after considering them in their entirety, in order to prepare a coated substrate containing a cured coating, which in turn is derived from a coating composition comprising a polymer containing carboxylic functional groups, a beta-hydroxyalkylamide curing agent, and an anti-oxidant, one skilled in the art would use a steel substrate, since both references clearly demonstrate the use of their respective coating

compositions over steel. Additionally, one is not likely to choose 2,6-di-tert-butyl-4-methyl-phenol from among a list of over fifty other anti-oxidants, without any guidance to do so offered by the Nakae reference. Further, since neither reference recognizes the improvement in filiform corrosion resistance over aluminum afforded by the use of 2,6-di-tert-butyl-4-methyl-phenol, there would be no particular impetus to use an aluminum substrate or 2,6-di-tert-butyl-4-methyl-phenol, and therefore it would not have been obvious to do so.

Claim 15

The discussion under the heading "Claims 5, 6, 13, 14, and 18" is incorporated herein by reference.

Claim 15 recites the coated aluminum substrate of claim 18 where said polymer is an acrylic polymer. The Examiner asserts in both Office Actions that Example 2A in Geary "shows the combination of carboxylic acid-containing polyester, carboxylic acid-containing acrylic polymer, a bis-hydroxyethylamide, and Irganox® 1076". As noted above, Geary discloses thermosetting powder coating compositions that comprise a co-reactable particulate mixture of carboxylic acid group-containing *polyesters* and beta-hydroxyalkylamide curing agents. The acrylic polymer disclosed in Example 2 is used in very minor amounts (less than 5 percent by weight of the resinous binder; less than 3.5 percent by weight of total resin solids). One skilled in the art would hardly look to Geary for a teaching of coating compositions containing carboxylic acid functional acrylics because Geary teaches a powder coating composition containing polyester polymers. Claim 15 is therefore believed to further distinguish the coated aluminum substrate of the present invention from Geary taken alone or in combination with Nakae.

Claims 7 and 9

The discussion under the heading "Claims 5, 6, 13, 14, and 18" is incorporated herein by reference.

Claim 7 recites the coated aluminum substrate of claim 18 wherein said polymer has an equivalent weight of from 200 to 2500. Claim 9 recites the

coated aluminum substrate of claim 18 wherein the beta-hydroxyalkylamide is bis-hydroxyethylamide. The arguments presented above with respect to claims 5, 6, 13, 14, and 18 apply here, and it is noted as above in the Grouping of Claims that claims 7 and 9 stand or fall together, independently of 5, 6, 13, 14 and 18. Claims 7 and 9 do not have Chasser applied against them (Issue (iv)(b)) and therefore stand separately from 5, 6, 13, 14 and 18.

(iv)(b) Whether the subject matter of 5, 6, 13-15, and 18 are obvious in view of the teachings of Chasser as evidenced by Laver taken in view of the teachings of Nakae.

Claims 5, 6, 13, 14 and 18:

Claims 5, 6, 13, 14, and 18 are assumed to be rejected under 35 U.S.C. §103(a) as being obvious over Chasser as evidenced by Laver and in view of Nakae. In both the Office Action of April 3, 2003, and the Final Office Action of August 26, 2003, the Examiner asserts that "Chasser discloses curable powder coating compositions comprising polymers with functional groups and curing agents reactive with the polymers that are applied to aluminum substrates (Abstract)." The Examiner further asserts that the polymers are selected from carboxylic acid group-containing polyester polymers having a number average molecular weight of 2000-3000, carboxylic acid group-containing acrylic polymers, carboxylic acid group-containing polyurethane polymers, and epoxy functional polymers. Polymers are used in preferred amounts of 50-85 percent by weight. Curing agents include beta-hydroxyalkylamides and triglycidylisocyanurate (TGIC). Irganox® anti-oxidants are noted as suitable additives. Example A shows the combination of a carboxylic acid-containing polyester, 12.9 percent by weight TGIC, and about 1 percent by weight Irganox® 1076. Laver provides the structure of Irganox® 1076. Example C shows the combination of a carboxylic acid-containing polyester, a beta-hydroxyalkylamide curing agent, and Tinuvin® 900, a phenolic ultraviolet light stabilizer having substituents at ortho positions to the hydroxy group. As noted by the Examiner in the Office Action of April 3, 2003, neither Chasser nor Laver

mentions the use of 2,6-di-tert-butyl-4-methyl-phenol. The Nakae reference teaches acid-epoxy type powder coating compositions comprising antioxidants having a melting point of from 50°C to 140°C. The Examiner relies on Nakae for teaching the use of 2,6-di-tert-butyl-4-methyl-phenol in powder coating compositions, asserting that certain phenol antioxidants, including 2,6-di-tert-butyl-4-methyl-phenol, are preferred in powder compositions because of their melting points. The Examiner concludes that it would have been obvious to one skilled in the art to choose 2,6-di-tert-butyl-4-methyl-phenol as a phenolic antioxidant in Chasser's composition to form coatings having improved blocking resistance and melt processability.

Appellants respectfully submit that the basis on which the claims were rejected is not a valid rejection under 35 U. S. C. §103(a). First, if the references are considered each in their entirety, there is no motivation to combine the teachings of Chasser with those of Nakae. Secondly, even if one were to combine the whole teaching of Chasser with the whole teaching of Nakae, one would not arrive at the present invention as claimed.

References Considered as a Whole Offer No Motivation to Combine

The Examiner in both Office Actions alleges that the motivation to modify the composition of Chasser with the 2,6-di-tert-butyl-4-methyl-phenol of Nakae is in order to form coatings having improved blocking resistance and melt processability. However, this proposed motivation to modify the Chasser reference with the teaching of Nakae to use 2,6-di-tert-butyl-4-methyl-phenol is not supported. As noted above, there is *no* teaching or suggestion in Nakae that 2,6-di-tert-butyl-4-methyl-phenol is better than Irganox® 1076 for blocking resistance and melt processability in *any* powder coating composition, let alone that 2,6-di-tert-butyl-4-methyl-phenol may be better than Irganox® 1076 for blocking resistance and melt processability in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents, which is only one of a collection of coating systems disclosed by Chasser that includes carboxylic acid functional polymers/polyepoxide curing

agents, carboxylic acid functional polymers/TGIC, and epoxy functional polymers/polyacid curing agents.

One skilled in the art would not be motivated to improve blocking resistance and/or melt processability of the Chasser composition by particularly choosing the 2,6-di-tert-butyl-4-methyl-phenol of Nakae because no teaching or suggestion is made in either reference, taken alone or in combination, of improved blocking resistance and/or melt processability offered by 2,6-di-tert-butyl-4-methyl-phenol. Additionally, there is no teaching or suggestion in either reference, taken alone or in combination, to select the 2,6-di-tert-butyl-4-methyl-phenol of Nakae for any reason and use it in a coating composition that contains carboxylic acid functional polymers and beta-hydroxyalkylamide curing agents.

References Considered as a Whole Teach Away from Invention

If one were to combine the whole teachings of Chasser with the whole teaching of Nakae, one would not arrive at the present invention as claimed. Chasser discloses curable powder coating compositions comprising polymers with functional groups and curing agents reactive with the polymers. The composition further comprises an oligomeric acid functional polyester with a particular structure as shown in col. 2, lines 40-48, which is the defining feature of the Chasser composition. The oligomeric polyester provides the composition with improved adhesion to metal and filiform corrosion resistance. The polymers with functional groups used by Chasser may be any of a variety of polymers with any of a variety of functional groups. Likewise, the curing agents may be selected from any of a number of different materials, depending on the functionality of the polymer. As mentioned above, carboxylic acid functional polymers/polyepoxide curing agents, carboxylic acid functional polymers/TGIC, and epoxy functional polymers/polyacid curing agents are all disclosed by Chasser as suitable coating systems. Nakae discloses exclusively an epoxy group-containing acrylic resin; a polycarboxylic acid; and an anti-oxidant having a melting point of from 50° to 140°C (Abstract). As noted above, list of over *fifty* anti-oxidants is provided, which includes 2,6-di-

tert-butyl-4-methyl-phenol and Irganox® 1076. There is no teaching or suggestion in Nakae that the anti-oxidants used therein are suitable for use in any other coatings; moreover, coatings comprising carboxylic acid group-containing resins and beta-hydroxyalkylamide curing agents are not disclosed at all in Nakae. The only coating composition disclosed in Nakae undergoes an acid-epoxy type cure mechanism. There is no teaching or suggestion that any of the other anti-oxidants in Nakae would be effective in a carboxylic acid/beta-hydroxyalkylamide system, much less that 2,6-di-tert-butyl-4-methyl-phenol would be equally effective as Irganox® 1076 a carboxylic acid/beta-hydroxyalkylamide system, such that one skilled in the art would be led to use the particular anti-oxidant 2,6-di-tert-butyl-4-methyl-phenol in the particular coating composition comprising carboxylic acid group-containing resins and beta-hydroxyalkylamide curing agents.

If the references are considered each in their entirety, the teachings of Nakae combined with Chasser teach away from the present invention. As mentioned earlier, Chasser discloses curable powder coating compositions comprising polymers with any of a number of functional groups and curing agents reactive with the polymers. Nakae discloses a powder coating composition comprising an epoxy group-containing acrylic resin; a polycarboxylic acid; and any of over fifty anti-oxidants having a melting point of from 50° to 140°C. If one were to combine both references after considering them in their entirety, in order to prepare a coated substrate containing a cured coating, which in turn is derived from a coating composition comprising a polymer containing functional groups, a curing agent, and an anti-oxidant, one skilled in the art would use an epoxy group-containing resin and a polycarboxylic acid curing agent, since that is the coating composition common to both references. Additionally, one is not likely to choose 2,6-di-tert-butyl-4-methyl-phenol from among a list of over fifty other anti-oxidants, without any guidance to do so offered by the Nakae reference. Further, since neither reference recognizes the improvement in filiform corrosion resistance over aluminum afforded by the use of 2,6-di-tert-butyl-4-methyl-phenol (Chasser has already achieved filiform corrosion resistance with the oligomeric polyester),

there would be no particular reason to use 2,6-di-tert-butyl-4-methyl-phenol, and therefore it would not have been obvious to do so.

Claim 15

The discussion under the heading "Claims 5, 6, 13, 14, and 18" is incorporated herein by reference.

Claim 15 recites the coated aluminum substrate of claim 18 where said polymer is an acrylic polymer. The arguments presented above with respect to claims 5, 6, 13, 14, and 18 apply here, and it is noted as above in the Grouping of Claims that claim 15 includes limitations that further distinguish this claim from the teachings of Geary (Issue (iv)(a)), which supports the standing of claim 15.

CONCLUSION

Appellants have shown that if the references are considered each in their entirety, there is no motivation to combine the teachings of the Geary reference with Nakae in order to arrive at the present invention. Likewise, there is no motivation to combine the teachings of the Chasser reference with Nakae in order to arrive at the present invention. Appellants have further shown that if one were to combine the whole teachings of Geary or Chasser with the whole teaching of the Nakae, one would not arrive at the present invention as claimed.

Based on the above, Appellants respectfully request that the Board reverse the Examiner on the rejections of claims 5, 6, 7, 9, 13, 14, 15 and 18 as unpatentable under 35 U.S.C. 103 over the applied prior art and allow these claims.

Respectfully submitted,

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Appendix
THE CLAIMS ON APPEAL

5. The coated aluminum substrate of claim 18 wherein said polymer containing carboxylic groups is selected from the group consisting of acrylic polymers, polyester polymers, and polyurethane polymers.

6. The coated aluminum substrate of claim 18 wherein said polymer has a number average molecular weight of from 1,000 to 20,000.

7. The coated aluminum substrate of claim 18 wherein said polymer has an equivalent weight equal from 200 to 2,500.

9. The coated aluminum substrate of claim 18 wherein the beta-hydroxyalkylamide is bis-hydroxyethylamide.

13. The coated aluminum substrate of claim 18 wherein said polymer is present in an amount ranging from 10 to 80 weight percent based on the total weight resin solids in the powder coating composition.

14. The coated aluminum substrate of claim 18 wherein said curing agent is present in an amount ranging from 2 to 40 weight percent based on the total weight resin solids in the powder coating composition.

15. The coated aluminum substrate of claim 18 where said polymer is an acrylic polymer.

18. A coated aluminum substrate containing a cured coating derived from a coating composition comprising:

a. a polymer containing carboxylic functional groups;

b. a beta hydroxyalkylamide curing agent having functional groups reactive with the functional groups of the polymer which is present in an amount sufficient to cure the polymer; and

c. 0.5 to 10 weight percent based on the total weight of resin solids in the coating composition of 2,6-di-tert-butyl-4-methyl-phenol, the coated substrate being characterized as having improved filiform corrosion resistance compared to a similar coated substrate that does not contain (c) in the cured coating.